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COR NO. 1690
25 June 1962
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PHOTOGRAPHIC EVALUATION REPORT
FORWARD CAMERA

Mission No: 9032 Photo Date: 18 Apr 62 Evaluation No: FE 29-62
Film Type: J-23-7600 Filter, Main: W 21 Filter, Horizon: W 25
Camera No: 72 (Fwd) Evaluated By: TK & ES

1. Shutter Operation:
 - a. Port Horizon - malfunction, (shutter remained open) on 59 frames of passes A04, D04, D05, D06, D07 and D08 degrading portions of the subsequent terrestrial photograph.
 - b. Starboard Horizon - Good
2. Slit Width: (Main Camera) 0.2" - Good
3. Exposure:
 - a. Port Horizon - 1/50 sec. (overexposed entire mission)
 - b. Starboard Horizon - 1/50 sec (overexposed entire mission)
4. Camera Number: Operational, overexposed throughout entire mission.
5. Binary Operation: Good throughout. See item 3 under Remarks.
6. Film Metering:
 - a. Port Horizon Camera - 0.11"
 - b. Starboard Horizon Camera - 0.20"
7. Film Tracking: Normal throughout mission.
8. Timing Pulses: Pulses occur in the image area and are readable only on engineering passes having no imagery.
9. Fiducials:
 - a. Main Camera: Fiducials vary from ragged to clear, possibly due to intermittent emulsion build-up and clearing.
 - b. Horizon Cameras: Sharp with no flare.
10. Flare: None noted.
11. Light Leaks: A total of 69 frames are degraded by light leaks. These are associated with the beginning and end of passes in addition to their presence in split pass camera on-off. Examples are: pass D00E, frames 7-8; pass D08, frames 36, 108, 109. Toward the end of the mission, specifically from pass D24 to end, a very heavy light leak is present in frame 3 which resulted in intermittent fogging of frames 4 and 5.
12. Static Electricity: This condition is evident in passes such as D24 and on engineering passes. It is assumed that it is also present in all passes although it could not be positively identified due to the presence of negating imagery. Examples include plus density and negative density, examples such as: pass D00E, frames 1, 2, 3, 4, 5; pass D03, frames 41, 43, 44, 45.
13. Pinholes: Intermittent throughout mission.
14. Abrasions and Scratches: A heavy camera-induced scratch occurs intermittently beneath either the sixteenth digit of the binary, the camera number or the port fiducial. Pass D20 contained scratches throughout, which were not present when the film arrived from the processor.
15. Tearing: No film tearing.
16. Water Marks: Only present on pass D31, frames 10, 11.
17. Pressure Streaks: Present throughout the mission on base side of the film.

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18. Processing Streaks: None evident.
19. Blistering and Frilling: No frilling evident. Blisters are present intermittently throughout the mission. Examples: pass D06, frames 6, 58; pass D24, frames 12, 122; pass A33, frames 46, 48.
20. Contrast: Low 20%, medium 75%, high 5%.
21. Apparent Resolution: Acuity of imagery for most of the frame is the best obtained by any mission to date. A slightly out-of-focus area is discernible for approximately three inches into the terrain format from the starboard border of the terrain format (eastern portion on ascending and western portion on descending passes with film oriented with line-of-flight pointing away from the observer). Imagery slightly sharper (except for the out-of-focus area) than that obtained from the aft camera.
22. Apparent Granularity: Fine
23. Photo Quality:
 - a. Main Cameras: Good. Degradation due to presence of slippage and fogging of terrain format by the horizon camera image.
 - b. Horizon Cameras: Imagery fair - overexposed. Reflections within system also present in images.
24. Camera Operation:
 - a. Main Camera: Good. Forward camera produced pressure marks (fogged patches) spaced approximately 6 inches apart. These are particularly evident in areas of low density. None evident on aft camera.
 - b. Horizon Camera: Port shutter remained open intermittently during six passes. Examples: pass A04, frame 10; pass D04, frames 10, 12, 14, 16, 22, 24, 28, 30.
25. Suitability for P.I.: Except where the horizon camera shutter remained open resulting in fogged frames and the out-of-focus area present in the forward camera, the imagery is the best obtained to date, thus this item was classified as good.

Remarks:

1. End-of-pass marker functioned correctly indicating the end of a pass, but blossomed on the last frame of each pass.
2. Light leaks appear on the last frame of all passes and intermittently on the first and third frames from the head and last three frames of passes. Examples: pass A13, frames 1, 31, 32; pass A29, frames 1, 3, 23, 24. The light leak found in frame 3 of passes A31, A32, A33, D33 fogged portions of frame 4 and may have extended into frame 5. This pattern was the same as reported on Mission 9029, Item 9c.
3. Multiple binary recordings are found usually associated with the camera off at the end of a pass and during split passes. Occasionally, a blurred binary is found on a frame not associated with the end of a pass.
4. Numerous small crimps are present, the majority of which should be attributed to film handling after arrival of the film from the processor.
5. Lifted emulsion occurred intermittently throughout the mission. Examples: pass D00E, frames 1-7; pass D03, frames 1, 2, 4, 7, 11, 16, 18, 20-22.
6. Foreign matter was found intermittently throughout the pass. Examples: pass D03, frames 1, 3, 9; pass D05, frames 11, 20, 36, 43, 66, 69.
7. Few desensitized spots were found. Examples: pass D00E, frames 1-8; pass A02 frames 8, 10.

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8. The following is a description of overlap and slippage for camera 72 as determined from the first and last frames of each pass whenever possible. Cloud cover, low sun angle and no imagery may have precluded determination in these areas in some passes.

	<u>Overlap</u>		<u>Slippage (From Take-up Side)</u>	
	<u>Beginning</u>	<u>End</u>	<u>First Frame</u>	<u>Last Frame</u>
FWD DOOE	---	---	---	6.50"
D01	---	---	---	---
A02	10%	21%	---	11.50"
A03	8%	25%	---	12"
D03	10%	---	---	---
A04	---	---	---	---
D04	4%	---	---	---
D05	0%	10%	---	---
D06	0%	4%	---	---
D07	---	3%	---	15"
D08	0%	7%	---	---
A09E	---	---	---	5"
D09	0%	4%	---	16"
A13	2%	---	13.50"	18"
A17	0%	2%	---	7.50"
A18	0%	4%	---	9"
A19	---	---	---	10"
A20	---	---	---	9.56"
D20	0%	0%	---	3.25"
D21	0%	0%	---	---
D24	0%	---	---	---
A25E	---	---	---	3.62"
A29	---	---	---	8"
A30	---	---	---	7.50"
A31	0%	10%	---	9"
D31	0%	0%	---	---
A32	0%	0%	---	8.50"
A33	5%	---	---	---
D33	0%	0%	---	---

9. Density readings were made on every pass using the Eastman Kodak Reflection Transmission Color Densitometer, Model RT. Absolute values read for D Max and D Min, as well as Gross Fog and Sun Angle are as follows:

<u>Pass</u>	<u>Frame</u>	<u>D Max</u>	<u>D Min</u>	<u>Gross Fog</u>	<u>Sun Angle</u>
A02	09	1.97	0.86	0.20	18° 30'
	84	2.22	----	0.19	24° 24'
A03	22	2.12	1.13	0.19	19° 53'
	81	2.21	----	0.20	24° 17'
D03	17	2.14	1.05	0.20	26° 29'
A04	18	2.10	0.43	0.10	25° 06'
D04	16	1.96	0.24	0.08	24° 56'
D05	12	2.02	0.62	0.09	27° 01'
	30	1.95	----	0.09	26° 26'
	49	1.92	0.30	0.08	25° 43'
	86	1.56	0.68	0.18	22° 45'
D06	03	2.16	----	0.19	27° 08'
	34	2.18	0.84	0.19	26° 03'
D07	12	1.94	0.66	0.20	27° 05'
	61	2.19	----	0.20	24° 29'
D08	18	2.16	----	0.19	28° 09'
	90	2.02	0.63	0.20	25° 43'
D09	15	2.19	----	0.18	27° 13'
	68	2.14	0.78	0.18	25° 03'

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<u>Pass</u>	<u>Frame</u>	<u>D Max</u>	<u>D Min</u>	<u>Gross Fog</u>	<u>Sun Angle</u>
A13	03	2.10	0.77	0.21	17° 24'
A17	16	2.19	1.08	0.20	18° 51'
A18	13	2.05	1.04	0.20	18° 07'
	60	2.20	-----	0.20	23° 21'
A19	34	2.20	1.04	0.18	20° 37'
	82	2.20	1.18	0.20	25° 05'
A20	12	2.25	1.09	0.19	24° 30'
D20	20	1.97	1.00	0.19	27° 18'
D21	13	2.23	-----	0.19	28° 44'
	42	2.10	0.88	0.19	27° 51'
	82	2.01	0.57	0.19	24° 48'
	150	2.05	0.77	0.23	20° 20'
D24	49	2.08	-----	0.20	28° 29'
	56	2.05	1.02	0.21	28° 15'
	97	2.14	0.55	0.20	26° 28'
	132	2.13	0.97	0.20	24° 30'
A29	11	2.18	-----	0.20	18° 21'
A30	06	1.98	0.73	0.20	15° 37'
A31	23	2.25	1.04	0.20	18° 23'
D31	09	2.22	0.60	0.19	26° 55'
A32	19	2.05	0.99	0.20	17° 19'
A33	12	2.07	0.88	0.20	17° 40'
	59	2.15	-----	0.21	22° 54'
D33	21	2.16	0.95	0.20	30° 18'

Average D Max 2.10
 Average D Min 0.81
 Average Gross Fog 0.18

Range D Max 2.25 - 1.56
 Range D Min 1.18 - 0.24
 Over-all Range 2.25 - 0.24
 Range Gross Fog 0.23 - 0.08

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10. Vehicle Attitude Data

Pass	Pitch Variation		Pitch Range	Roll Variation		Roll Range	No. of Frames
DOOE	14° 44'	14° 15'	29'	-0° 47'	-0° 30'	17'	8
A02	13° 31'	13° 02'	29'	-0° 44'	+0° 23'	39'	97
A03	13° 39'	13° 05'	34'	-0° 30'	+0° 24'	54'	95
D03	13° 42'	13° 22'	20'	-0° 09'	+0° 07'	16'	53
A04	14° 01'	13° 06'	55'	+0° 40'	-0° 38'	1° 02'	38
D04	14° 06'	13° 31'	35'	-0° 58'	+0° 07'	1° 05'	30
D05	14° 12'	13° 19'	53'	-0° 53'	-0° 14'	39'	114
D06	14° 26'	13° 25'	1° 01'	-0° 59'	+0° 32'	1° 31'	98 split
D07	14° 09'	13° 13'	56'	-1° 16'	+0° 21'	1° 37'	83
D08	14° 07'	13° 12'	55'	-1° 10'	+0° 03'	1° 13'	109 split
D09	14° 19'	13° 14'	1° 05'	-1° 17'	-0° 06'	1° 13'	93
A13	13° 40'	13° 07'	33'	-1° 17'	-0° 08'	1° 09'	32
A17	13° 46'	12° 32'	1° 14'	-1° 28'	-0° 24'	1° 04'	32
A18	13° 59'	12° 57'	1° 02'	-1° 03'	0° 00'	1° 03'	80
A19	14° 02'	13° 19'	43'	-1° 59'	+0° 18'	2° 17'	95
A20	14° 05'	13° 05'	1° 00'	+0° 50'	+0° 14'	36'	27
D20	14° 00'	13° 18'	42'	+0° 54'	-0° 22'	1° 16'	57
D21	13° 57'	13° 31'	26'	+1° 28'	-1° 10'	2° 38'	159 split
D24	13° 59'	13° 28'	31'	-0° 41'	+0° 08'	49'	134
A29	13° 56'	13° 21'	35'	-1° 30'	-0° 10'	1° 20'	24
A31	13° 40'	13° 10'	30'	-1° 53'	-0° 31'	1° 22'	43
D31	14° 21'	14° 13'	08'	+0° 40'	+0° 02'	38'	12
A32	----	-----	----	-2° 01'	+0° 03'	2° 04'	44
A33	13° 56'	12° 59'	57'	-1° 23'	+1° 00'	2° 23'	74
D33	13° 38'	13° 21'	17'	-0° 53'	-0° 23'	33'	27

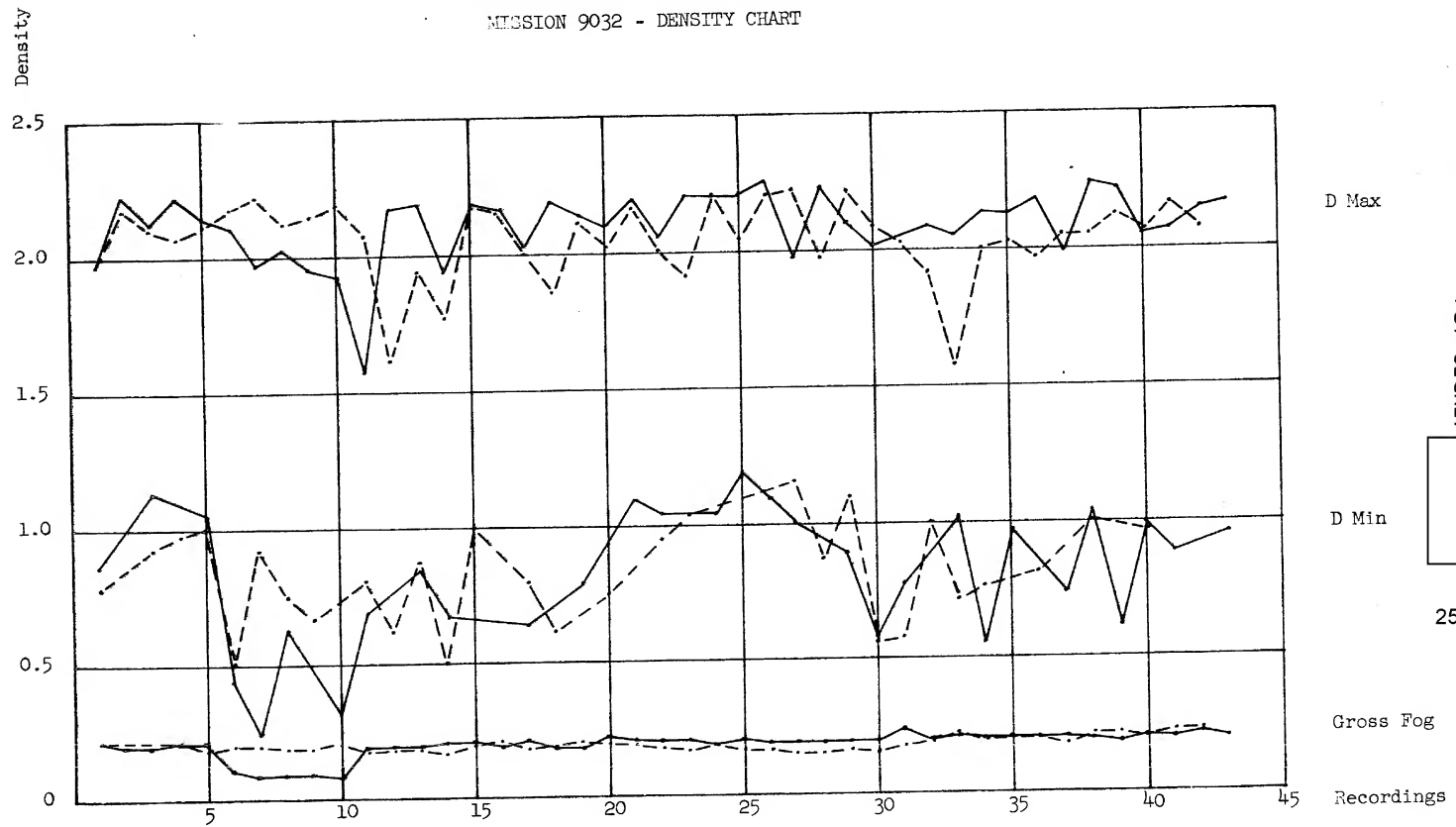
Note: Compiled from FWD camera computations.

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MISSION 9032 - DENSITY CHART



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— Forward Camera
--- ART Camera
... Gross Fog

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PHOTOGRAPHIC EVALUATION REPORT
AFT CAMERA

Mission No: 9032	Photo Date: 18 April 62	Evaluation No.: FE 30-62
Film Type: J-23-7600	Filter, Main: W 21	Filter, Horizon: W 25
Camera No: 73 AFT	Evaluated By: TK & ES	

1. Shutter Operation:
 - a. Port Horizon - Good
 - b. Starboard Horizon - Good
2. Slit Width - (Main Camera) 0.2" - Good
3. Exposure:
 - a. Port Horizon = 1/50 sec, overexposed
 - b. Starboard Horizon = 1/50 sec, overexposed
4. Camera Number: Operational, slightly overexposed
5. Binary Operation: Operational throughout mission. Slightly overexposed
6. Film Metering:
Port Horizon Camera - 0.11"
Starboard Horizon Camera - 0.20"
7. Film Tracking: Normal throughout mission
8. Timing Pulses: Pulses are more legible than those of forward camera. Flare from timing pulses has spread slightly into trailing edge of terrain format.
9. Fiducials:
 - a. Main Camera - center, and one 3" from center partially filled (ragged); others clean.
 - b. Horizon Cameras - operational although slightly overexposed.
10. Flare: None noted.
11. Light Leaks: A light leak is present on the leading edge of the frames and extends into the main format on frame 1 of each pass. Additional light leaks are the "bar pattern", usually two or three frames from the end of pass or camera-off position on split passes; a single diagonal pattern either on the last or next-to-last frame and in the first frame of each pass; additional fogging is found intermittently near the beginning and end of passes. Examples: Pass D00E, frames 1, 4, 5; pass D03, frames 1, 51, 52; pass D05, frames 1, 12, 13, 71. A shadow pattern can be noted intermittently in the Port Horizon Camera, Example: D00E, frame 6.
12. Static Electricity - few examples in the AFT camera frames: Pass D20, frame 51; pass D33, frame 25. Static is frequently observed where the film clamp was engaged near the horizon cameras.
13. Pinholes: None noted.
14. Abrasions and Scratches: Camera induced scratches (quite deep) throughout most of mission below fiducial located four inches from frame border and/or below camera number. Examples: Pass D05, pass D07, pass A17, pass A30. Other scratches are found intermittently throughout the mission. Examples: Pass A02, frames 1, 26, 61-63, 90; pass A17; frame 17; pass A19, frames 11, 76.

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15. Tearing: No film tearing found
16. Water Marks: Few observed. Examples: Pass D03, frame 31; Pass D09, frame 11; Pass D24, frames 59-61, 67.
17. Pressure Streaks: Present throughout mission on base side of film.
18. Processing Streaks: None evident.
19. Blistering and Frilling: No frilling evident. Few blisters are present. Examples: Pass A04, frames 19, 37; Pass A17, frame 15; Pass D20, frame 5; Pass D21, frame 138.
20. Contrast: Low 15%, Medium 75%, High 10%
21. Apparent Resolution:
 - a. Main Camera - Imagery obtained is not quite as sharp as that obtained by the forward camera, however, it is better than that obtained from any previous mission. No out-of-focus areas were noted.
 - b. Horizon Cameras:
 - Port Horizon Camera - out-of-focus
 - Starboard Horizon Camera - good
22. Apparent Granularity - Fine
23. Photo Quality:
 - a. Main Camera - good. Degradation due to a negative density streak that is present the entire width of frame, 0.25 inch into the terrain format near the leading edge of the film. Other plus-density and negative-density streaks are present intermittently throughout the mission.
 - b. Horizon Cameras - fair; Port Horizon Camera, out-of-focus. Reflections present in some frames. Example: Pass D00E, frames 2, 4, 6. Mostly overexposed.
24. Camera Operation:
 - a. Main Camera - good
 - b. Horizon Camera - good
25. Suitability for P.I.: Although the imagery is not quite as sharp as that from the forward camera it is the best obtained from any mission to date, as this item is classified as good.

Remarks:

1. The end-of-pass marker functioned correctly although slightly heavy (overexposed). No "blossoming" is present.
2. The light leak pattern as described in Mission 9029, Item 9C, appears from Pass A20 to the end of the mission resulting in fogging frame 3, and after Pass D33 frames 4 and intermittently frame 5. Other light leak patterns are fully described under Item 11 of this report.
3. Multiple binary recordings are found usually associated with the camera-off at the end of a pass and during split passes. Occasionally, a blurred binary is found on a frame not associated with the end of a pass.
4. Numerous small crimps are present, the majority of which should be attributed to film handling after arrival of the film from the processor.
5. Lifted emulsion is present intermittently on the film. Examples: Pass D00E, frames 1, 2, 5; Pass D05, frames 10, 98, 105; Pass A17, frames 1, 15, 28, 31; Pass D33, frames 2, 3, 10, 24, 25.
6. Foreign matter on the film is present intermittently throughout the film and ranges from gum transfer from splices to particles embedded in the emulsion. Examples: Pass D03, frames 10, 21, 52, 53; Pass D09, frames 61, 67, 68, 75, 92; Pass D21, frames 2, 58, 110, 113, 116, 118, 148, 158.

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7. Few densensitized spots are present on the film. Examples: Pass DOOE, frames 1, 3; Pass DO5, frame 96; Pass D24, frame 107.
8. The following is a description of overlap and slippage for camera 73 as determined from the first and last frames of each pass whenever possible. Cloud cover, low sun angle and no imagery may have precluded determination in these areas for some passes.

Pass	Overlap		Slippage (From take-up side)	
	Beginning	End	First Frame	Last Frame
DOOE	---	---	None	6.62"
DO1	---	---	4"	5.37"
A02	12%	21%	3.50"	10"
A03	8%	23%	---	10.37"
DO3	8%	---	---	16"
A04	---	---	14.12"	10.50"
DO4	4%	---	None	15.25"
DO5	None	12%	12.75"	18"
DO6	None	8%	15.50"	18.12"
DO7	None	3% (Frame 39)	16.12"	16.12"
DO8	None	8%	14"	14"
A09E	---	---	13.75"	3"
DO9	None	5%	0.37"	15.25"
A13	None	7%	13.50"	6.37"
A17	None	1%	4.50"	5.75"
A18	None	2% (Frame 49)	3.75"	8"
A19	None	4%	Not Measurable	8.25"
A20	---	---	Not Measurable	7.75"
D20	None	None	Not Measurable	12.75"
D21	None	None	Not Measurable	15.25"
D24	None	---	13.37"	Not Measurable
A25E	---	---	Not Measurable	2"
A29	---	---	Not Measurable	7"
A30	None	---	5"	6.50"
A31	None	12%	4.50"	7.50"
D31	None	None	5.50"	13.25"
A32	---	---	Not Measurable	8"
A33	None	15%	Not Measurable	12"
D33	None	12%	9.25"	Not Measurable

9. Density readings were made on every pass using the Eastman Kodak Reflection-Transmission Color Densitometer, Model RT. Absolute values read for D Max, D Min, Gross Fog and Sun Angle are as follows:

Pass	Frame	D Max	D Min	Gross Fog	Sun Angle
A02	09	1.96	0.76	0.20	18° 31'
	84	2.17	---	0.20	24° 29'
A03	23	2.10	0.91	0.20	20° 00'
	80	2.06	0.97	0.20	24° 16'
DO3	23	2.10	1.00	0.18	26° 18'
	48	2.16	0.50	0.19	25° 26'
A04	29	2.21	0.92	0.19	25° 17'
	21	2.11	0.74	0.18	24° 42'
DO4	25	2.14	0.66	0.18	24° 31'
	18	2.18	---	0.20	26° 50'
DO5	52	2.06	0.80	0.17	25° 35'
	110	1.60	0.60	0.18	21° 28'
DO6	37	1.94	0.86	0.18	25° 55'
	81	1.76	0.49	0.16	21° 28'
DO7	03	2.17	0.99	0.19	27° 21'
	79	2.15	---	0.20	23° 33'
DO8	43	2.00	0.78	0.17	27° 21'
	95	1.85	0.60	0.19	25° 30'

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<u>Pass</u>	<u>Frame</u>	<u>D Max</u>	<u>D Min</u>	<u>Gross Fog</u>	<u>Sun Angle</u>
D09	18	2.12	----	0.20	27° 06'
	77	2.02	0.74	0.19	24° 36'
A13	26	2.16	----	0.18	20° 24'
A17	15	2.00	0.94	0.17	18° 38'
A18	15	1.90	1.04	0.16	18° 27'
	64	2.20	----	0.18	23° 49'
A19	11	2.04	----	0.16	17° 43'
	80	2.20	----	0.16	25° 02'
A20	18	2.22	1.15	0.15	25° 03'
D20	24	1.97	0.86	0.15	27° 06'
D21	14	2.21	1.09	0.16	28° 42'
	47	2.09	0.55	0.15	27° 39'
	117	2.01	0.57	0.17	22° 31'
D24	52	1.91	0.99	0.19	28° 22'
	73	1.56	0.71	0.21	27° 34'
	103	2.00	0.76	0.20	26° 06'
A29	10	2.02	----	0.20	18° 16'
A30	11	1.97	0.81	0.18	16° 22'
A31	33	2.05	----	0.21	19° 39'
D31	12	2.05	1.00	0.21	26° 45'
A32	17	2.12	----	0.20	17° 06'
A33	02	2.06	0.97	0.21	16° 18'
	42	2.16	----	0.22	21° 17'
D33	25	2.07	----	----	30° 17'

Average D Max 2.04
 Average D Min 0.82
 Average Gross Fog 0.18

Range D Max 2.22 - 1.56
 Range D Min 1.15 - 0.50
 Range D Max to D Min 2.22 - 0.50
 Range Gross Fog 0.22 - 0.15